

REMARKS

Claims 2, 5-7 (sic) are rejected under Section 112, second paragraph. Claims 2 and 4 have been amended to put them in proper Markush form and reconsideration and withdrawal of the Section 112 rejection is respectfully requested.

Claims 6 and 7 is rejected as being vague and indefinite in reciting "is included at a rate which comprises...". Applicant respectfully disagrees with this ground of rejection in that it assumes that the term "rate" necessarily means a time-based application of the material. It is clear to a person skilled in the art reading the application that the claim language defines the weight percent of the surfactant relative to the animal feed. In any event, claims 6 and 7 have been amended to remove the term "rate" without changing the meaning of the claims. Reconsideration and withdrawal of the Section 112 rejection is respectfully requested.

Claim 5 is rejected as being confusing in that the amount of the enzyme cannot be determined from the recitation "an amount to provide xylanase activity of between about 5,000 and about 50,000 units/kilogram of animal feed", since the activity, and the amount to be added, would depend on the nature and purity of the enzyme provided. Applicant respectfully asserts that the claim language adequately defines the invention to a person of skill in the art. Such a person recognizes that enzymes are provided with statements of purity and activity level and so would understand immediately how much of a particular enzyme source would be needed in order to satisfy the language of the claim. The references cited in this application are replete with descriptions of the amount of enzymes to be added to a feed specified by the number or range of activity of the recited enzymes per weight of the feed (see, for example, col. 10 of the Bedford et al. reference).

Reconsideration and withdrawal of the Section 112 rejection is respectfully requested. The claims are rejected under Section 102 and 103 on the basis numerous references. The claims have been amended to be limited only to lysolecithin, a compound which includes lysophospholipids. None of the references teaches the combination of an enzyme and a lysophospholipid wherein the lysophospholipid increases the activity of the enzyme.

In Zimmerman et al., an emulsifier system (containing lecithin) is used 1) to provide lubrication for machine ability of a dough 2) to entrap and retain air in the dough and 3) to help reduce starch gelatinisation during baking (by complexing with amylose). While they mention a xylanase enzyme, but it is the alpha-amylase enzyme which is influencing the starch gelatinisation. Zimmerman et al. does not teach or suggest the addition of lysophospholipids to boost the activity of an enzyme.

In Bedford et al., no mention is made of either lecithin or lysolecithin; it describes only the use of enzyme feed additives in animal feeds. The principal teachings of Bedford et al., relate to the hydrolysis of cellulose resulting in a decrease in feed conversion rate and/or increase in digestibility. Bedford et al. does not teach or suggest the addition of lysophospholipids to boost the activity of an enzyme.

The Mäntykoski-Paukku reference teaches lecithin in fish feeds as a bonding agent. The enzyme protein is described as causing the breakdown of the fish meal with enzymes in order to convert it into smaller particles more appropriate for young fish. Mäntykoski-Paukku does not teach or suggest the addition of lysophospholipids to boost the activity of an enzyme.

The Shiina article teaches the addition of lecithin to a food composition which comprises wheat and the enzyme lipase. No claim is made to the boosting effect of the combination of ingredients or any interaction to each other. Shiina does not teach or suggest the addition of lysophospholipids to boost the activity of an enzyme.

The Lenz et al. article describes the water binding capacity of the hemicellulose component. Lecithin is used, as an emulsifier, and to breakdown the starch in baking an amylase enzyme is commonly used. No reference is made to any boosting effect of on the enzyme activity. Lenz et al. does not teach or suggest the addition of lysophospholipids to boost the activity of an enzyme.

The application has been amended to correct minor informalities, to further distinguish the application over the prior art, and to more particularly point out and distinctly claim the subject matter which Applicant regards as the invention so as to place the application, as a whole, into a prima facie condition for allowance. Great care has been

taken to avoid the introduction of new subject matter into the application as a result of the foregoing modifications.

Accordingly, the purpose of the claimed invention is not taught nor suggested by the cited references, nor is there any suggestion or teaching which would lead one skilled in the relevant art to combine the references in a manner which would meet the purpose of the claimed invention. Because the cited references, whether considered alone, or in combination with one another, do not teach nor suggest the purpose of the claimed invention, Applicant respectfully submits that the claimed invention, as amended, patentably distinguishes over the prior art, including the art cited merely of record.

Based on the foregoing, Applicant respectfully submits that its claims 1-9, as amended, are in condition for allowance at this time, patentably distinguishing over the cited prior art. Accordingly, reconsideration of the application and passage to allowance are respectfully solicited.

The Examiner is respectfully urged to call the undersigned attorney at (515) 288-2500 to discuss the claims in an effort to reach a mutual agreement with respect to claim limitations in the present application which will be effective to define the patentable subject matter if the present claims are not deemed to be adequate for this purpose.

Respectfully submitted,

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ATTORNEYS FOR APPLICANT

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1. A method for improving the effectiveness of an enzyme in an animal feed, comprising the step of adding the surfactant lysolecithin to an animal feed containing an enzyme feed additive.
  2. A method as defined in claim 1, wherein said enzyme is selected from the group consisting of alpha-amylase, alpha-galactosidase, beta-glucanase, cellulase, lipase, protease and xylanase.
  3. A method as defined in claim 1, wherein said animal feed includes from between about 10 weight percent to about 55 weight percent of a small cereal grain.
  4. A method as defined in claim 3, wherein said small cereal grain is selected from the group consisting of wheat and barley.
  5. A method as defined in claim 4, wherein said enzyme is added to said animal feed to provide exogenous xylanase activity of between about 5,000 and about 50,000 xylanase units per kilogram of said animal feed.
  6. A method as defined in claim 5, wherein said surfactant is between about 0.0025 weight percent and about 0.025 weight percent of the animal feed.
  7. A method as defined in claim 1, wherein said surfactant is between about 0.0025 weight percent and about 0.025 weight percent of the animal feed.
  8. An animal feed supplement comprising: a source of at least one exogenous enzyme having enzyme activity selected from the group consisting of alpha-amylase, beta-glucanase, cellulase, lipase, protease and xylanase activities; and the lysolecithin.
  9. An animal feed supplement as defined in claim 8, wherein said surfactant comprises at least about 8 percent lysophospholipids by weight.